



## Filling the “Donut Hole”: Fire Ecology in the Central Grasslands

**Sherry Leis**, Fire Ecologist, Heartland Network

Until June 2007, parks in the Central Grasslands region lacked a National Park Service Fire Ecologist. The Midwest Fire Ecology Program filled the void, affectionately referred to as “the donut hole” by funding the position through a cooperative agreement with Missouri State University. The new Fire Ecologist was embedded within the Heartland Network (HTLN) Inventory and Monitoring (I&M) Program. The Heartland Network is charged with collecting long-term data on important ecological aspects of NPS parks in the region, called “vital signs”. Monitoring data are analyzed and reported back to parks so that park Natural Resource Managers can evaluate their programs using an adaptive model.

I&M staff share responsibilities for collecting and analyzing long-term ecosystem data so that network staff fill some of the functions of a fire ecology monitoring crew. The networks collect a vast amount of ecological data relevant to fire ecology. Being embedded within the Heartland Network

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## Northern Great Plains News: Interagency Cooperation on the NGP

**Cody Wienk**, Midwest Regional Fire Ecologist and  
**Andy Thorsensten**, Lead Monitor, Wind Cave NP

*We must hang together, gentlemen...else,  
we shall most assuredly hang separately.  
- Benjamin Franklin*

As with any year in the Northern Great Plains (NGP) Fire Ecology Program, 2007 included a mixture of routine monitoring work as well as some new and exciting projects, the first of which was an interagency project with the South Dakota Field Office (SDFO) of the Bureau of Land Management. The SDFO began the process to update their Resource Management Plan. Their existing plan had no fire ecology information and the SDFO had no fire ecology expertise on their staff. The state fire management officer contacted the NPS Northern Great Plains Fire Ecology Program to gather baseline information on the status of fire related resource issues on BLM lands.

The BLM Notice of Intent to write a new Resource Management Plan stated:

All proposed management actions will be based upon best available scientific information, research and technology, as well as existing inventory and monitoring information.

We developed a simple site assessment protocol for BLM lands across the state. Using this method, we assessed fire regime condition class, provided a general description of the vegetation community, identified non-native species issues and listed relevant fuel models. Using the wisdom that a picture is worth a thousand words, photography

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## Pineland Croton and Butterfly Habitat: Fire Fx Monitoring in Everglades National Park

**Aerin Land**, Assistant Lead Fire Effects Technician, Everglades National Park

In the summer of 2005, Everglades Fire Effects initiated fire effects monitoring of pineland croton (*Croton linearis* Jacq.), the host plant of the Bartram's hairstreak (*Strymon acis bartrami*) and Florida leafwing (*Anaea troglodyta floridaalis*) butterflies. This monitoring effort was started to provide preliminary information on pineland croton and butterfly response to fire for our adaptive fire management program.

Following National Park Service Fire Monitoring Handbook guidelines, plots have been sampled pre- and post- burn for short-term and long-term fire effects within Everglades National Park since 1999. Two plots within the Long Pine Key (LPK) pine rocklands were selected for pineland croton monitoring. Selection criteria were for plots with existing fire effects data in areas with a history of Bartram's hairstreak and the Florida leafwing observations. Plot G was installed for a fire ecology vegetation study conducted by Dr. William Platt of Louisiana State University. The Louisiana State University study began in 1996 and concluded in 2000. Plot J follows NPS long-term fire effects monitoring protocols. The dimensions of both plots are 20x50 meters. Biologists from Everglades Fire Effects visit each plot monthly to measure the height and crown area of pineland croton, count the number of flowers and fruits and to note the presence of eggs, larvae and caterpillar herbivory on pineland croton. Also, the biologists record the presence of adult Bartram's hairstreak and/or Florida leafwing if observed within the plot.

When the monitoring was initiated in the Plot G, 91 pineland croton were located and tagged in the entire 20x50 meter area. Pineland croton in quarters 1 and 4 (n = 59) were designated for observation. Recent disturbance history for Fire Block G includes prescribed fires in 2003 and 2006

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## Rx Effects Lives to Fight Another Day

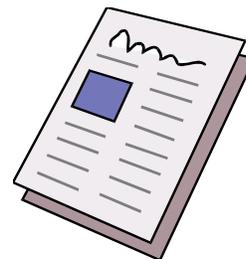
**Lisa McInnis**, Fire Ecologist, Natchez Trace Parkway

As many of you may recall, Eric Miller was the former editor of the *Rx Effects* newsletter. When he moved on to another job, it became necessary to determine how and if the newsletter was going to continue. In the winter of 2008, I sent out a survey asking folks if they were interested in the continuation of the *Rx Effects* newsletter, and what sorts of issues might be appealing. I got an overwhelming response in favor of seeing the newsletter continue.

The goal of the newsletter is to provide highlights on current research going on in area of fire ecology and fuels management. *Rx Effects* was (and is, I hope) a grassroots publication, created by and for the peeps to create a sense of community in the fire monitoring world, if you will. Many of you commented that you would like to see the publication continue in this vein.

This is not to say we can't expand or change direction. Many of you indicated you'd like to see this publication become more interagency in nature, and perhaps include some updates from the regional/national level. Several people noted that they would like to know more about the employees in each program- who is where. It is my hope that future newsletters will address some of these issues.

A word of thanks is in order to Eric Miller and haiku extraordinaire Mitch Burgard, who were responsible for the creation of the newsletter. Thanks also to all that submitted the survey, and especially to all those that contributed articles to this edition. **Keep 'em coming!** I will accept and accumulate articles all year round, but the deadline for submission for the next issue will be the last Friday of April, 2009. Don't worry, I'll remind you!

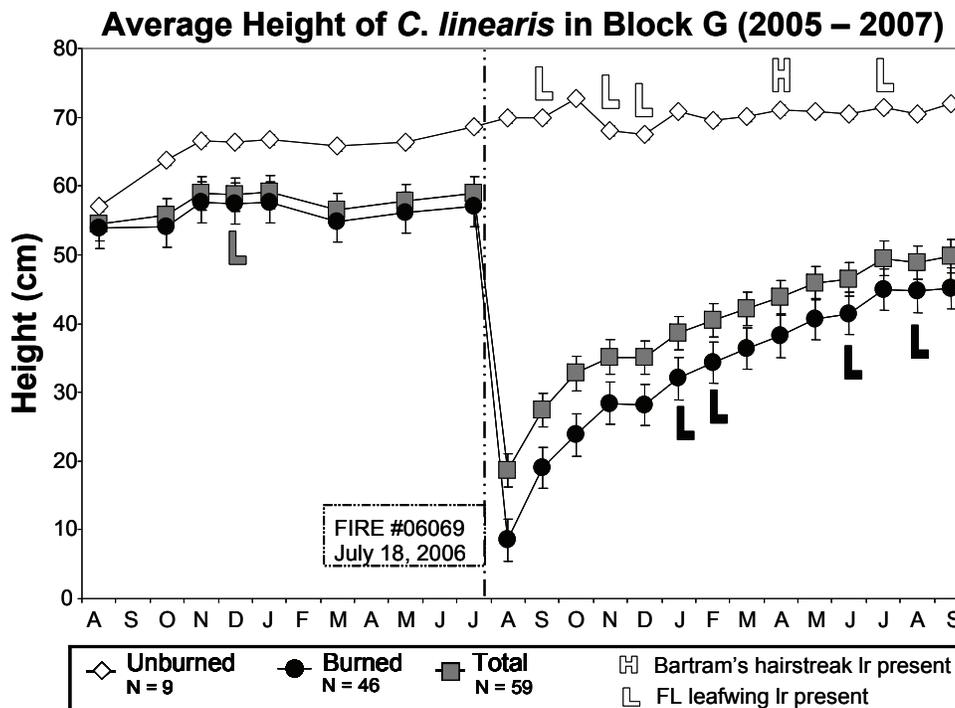


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Table 1. Pineland croton measurements and number of larvae detected following the July 18, 2006 fire. The “u” indicates that larvae were found on unburned plants and the “b” indicates that larvae were found on the resprouts of burned plants.

	2006					2007	
	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Unburned avg height (cm)	69.8	69.9	72.8	68	67.4	70.8	69.6
Unburned avg crown area (cm <sup>2</sup> )	792.8	875.5	854.8	772.3	575.6	507.5	599.1
Burned avg height (cm)	8.5	19	23.8	28.4	28.2	32	34.4
Burned avg crown area (cm <sup>2</sup> )	41.9	130.4	193.9	230	256.4	248.3	282.1
# Florida leafwing lr	0	1 u	0	3 u	1 u	1 b	1 b
# Bartram’s hairstreak lr	0	0	0	0	0	0	0
	2007						
	Mar	Apr	May	Jun	Jul	Aug	Sep
Unburned avg height (cm)	70.1	71	70.7	70.6	71.3	70.5	71.9
Unburned avg crown area (cm <sup>2</sup> )	730.7	846.9	951.7	1042.9	1113.5	1268.1	1079.7
Burned avg height (cm)	36.4	38.2	40.6	41.4	44.9	44.6	45.1
Burned avg crown area (cm <sup>2</sup> )	380.1	434.4	437.6	461.8	585.2	600.3	644.2
# Florida leafwing lr	0	0	0	1b	1u	2b	0
# Bartram’s hairstreak lr	0	1 u	0	0	0	0	0

and two hurricanes in 2005. Monitoring began August 23, 2005, just prior to the arrival of Hurricane Katrina. The 2006 prescribed fire occurred on July 18, at a time when water levels and fuel moisture were elevated. These summer conditions resulted in a fire that was patchy and of low severity and intensity, which allowed some vegetation to escape the effects of the fire. Four of the original 59 tagged pineland croton either suffered mortality or could not be relocated in the months prior to the fire. Of the remaining 55 pineland croton, 84% (n=46) showed evidence of having been burned by the fire, the remaining 16% (n=9) appeared unburned (Table 1; Fig 1; Fig 2), which illustrates the patchy, mosaic burn pattern of the fire.



Of the 46 plants burned in the fire, 96% (n= 44) resprouted within a few months following the fire (Fig. 1; Fig. 2). The resprouts grew rapidly, averaging 8.5 cm in height by August and growing another 10.5 cm in September and 4.8 cm in October, after which growth rates slowed (Table 1).

Figure 1. Average height of pineland croton in block G. The letters indicate the dates on which Florida leafwing (L) or Bartram’s hairstreak (H) larvae were observed. White letters indicate larvae were found on unburned *C. linearis* and black letters indicate that larvae were found on resprouts of burned *C. linearis*.

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provides some unique opportunities such as access to long-term data and established monitoring sites that will benefit the NPS fire ecology program, parks, and HTLN. More information about HTLN can be found at: <http://science.nature.nps.gov/im/units/htln/index.cfm>.

One project I was able to complete shortly after my arrival as a fire ecologist was a report on 21 years of monitoring at Herbert Hoover NHS (HEHO). Dr. Paul Christiansen in cooperation with park staff installed monitoring plots at HEHO beginning in 1982. He sampled these plots annually and reported his findings to the park. In 2004, HTLN was brought on the scene to continue monitoring at HEHO. HTLN began to install sampling sites in a way that would preserve some of the Christiansen sites, but they discovered that much of the 21-years worth of data was not electronically archived and little analysis for long-term trends had been completed. Network staff, seeing the importance of the data, began documenting Dr. Christiansen's methods, sampling locations, and archiving data. With all this background work in place, I was able to complete a report which focused on long-term fire effects at the park. In addition to archiving and analyzing the vast amount of plant data, we converted fire history maps of the park to GIS.

The full report can be found at: [http://science.nature.nps.gov/im/units/htln/library/monitoring/reports/HEHO%20long-term%20report-NRTR\\_V.10\\_2007\\_final.pdf](http://science.nature.nps.gov/im/units/htln/library/monitoring/reports/HEHO%20long-term%20report-NRTR_V.10_2007_final.pdf). In summary, we found that species richness has grown from a planting of five grass species in 1971 to 200 species including a variety of plant guilds, but species richness tends to decline with time since fire. Grass dominance decreased while warm season forbs increased as a result of additional native plantings, invasive species management, and fire application. Woody plants have been consistently low while spring forbs spike in burn years. Finally, exotic species continue to be a challenge for local staff. Future analysis will attempt to provide a crosswalk between Christiansen's monitoring design and HTLN's current long-term design.

### Monitoring Tip of the Day:

Scratched or maimed vegetation monitoring poles are a real downer for the fire effects monitor. Veg pole holders can easily be made out of 1" PVC pipe with endcaps, and mounted in the vehicle using zip ties. Add some cotton to the holder to prevent rattling while traveling!



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### Rx Effects has a New Home!

In April the newsletter went up to the NIFC website. Tina Boehle will capably manage the web end of things in Boise.

[http://www.nps.gov/fire/fire/fir\\_eco\\_rxeffects.cfm](http://www.nps.gov/fire/fire/fir_eco_rxeffects.cfm)

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played an important role in capturing the ecological condition. We established photopoints with watermarked, geo-referenced images for each site visited. The project will be completed in 2008. We've really enjoyed working on something different and getting the opportunity to visit some new parts of the state.

The other new development last year was the creation of the NGP Fire Use Module. We configured the NGP fire effects crew as a fire use module as we already had many of the qualifications required for an interagency fire use module. This required the creation of a module in the ROSS system and finding individuals to fill two positions to meet the minimum requirements (FALB and EMT). This turned out to be quite successful as the crew went out on two fire use assignments, one to the Selway-Bitterroot Wilderness in Idaho and one to the Grand Canyon. These assignments provided an excellent opportunity for the NGP fire monitors to observe fire behavior in new fuel types. The module received excellent performance ratings on each assignment and we hope to have future assignments on prescribed and fire use fires.

## NGP Interagency Site Assessment Tool: An Example

Site Name: SE Edgemont (mesa top)

Date: 22 May 2007 BLM Map: Hot Springs

Assessment by: C. Wienk, M. Lund,

A. Thorstenson, L. Mitchell,

K. Mitchell, L. Barney

T/R/S: T9S, R3E, Sec 11 & 14

Lat: 43° 16.098' Long: 103° 43.625'

Datum: NAD 83

Anderson Fuel Model: 1 & 2

Scott & Burgan Fuel Model: GR2



Figure 1: Example of photo-documentation of SE Edgemont site used in Northern Great Plains interagency site assessment tool.

### Vegetation Community

General description of vegetation communities:

The majority of this site is relatively flat mesa top bounded by cliffs breaking to the Cheyenne River on the north and east. The mesa top is covered with mixed-grass prairie and a few small patches of ponderosa pine. Open ponderosa pine stands also occur on the steep slopes above the river.

Community	% of Site	Dominant Species
mixed-grass prairie	85	western wheatgrass, needle-and-thread, sedges, buffalo grass, annual brome
open ponderosa pine	15	ponderosa pine, Rocky Mountain juniper, western wheatgrass, needle-and-thread, sedges, buffalo grass, annual brome

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Prior to the 2006 prescribed fire one Florida leafwing larva was observed feeding on one of the monitored pineland croton. Within 2 months following the fire, Florida leafwing larvae were detected on unburned pineland croton and by the 6<sup>th</sup> month post fire Florida leafwing larvae were feeding on the resprouts of the burned pineland croton (Table 1; Fig 1; Fig 2). One Bartram's hairstreak larva was detected within the plot on an unburned pineland croton in April 2007, 9 months post fire (Table 1; Fig1; Fig 2). Additionally, one adult Bartram's hairstreak was observed within the plot on May 25, 2007.

In Plot J, monitoring was initiated on July 19, 2005, at that time 9 pineland croton were located and tagged. Recent disturbance history for the Fire Block J includes a prescribed fire in 2003 and two hurricanes in 2005. The pineland croton within Plot J differed from those in Plot G, both in population size and appearance. The Plot J pineland croton are

characterized by a relatively sparse crown with an unidentified black fungus on the leaves. Two of the 9 pineland suffered mortality in October of 2005. In September 2006, 2 Florida leafwing larvae were found feeding on one of the monitored pineland within the plot. This plant was denuded of all but a few leaves by the feeding in October/November, but re-leafed in December 2006. Although no Bartram's hairstreak larvae were detected within Plot J, we did observe 2 larvae feeding on one pineland croton approximately 80 meters from the plot. Additionally, an adult Bartram's hairstreak was observed approximately 300 meters from the plot, on May 18, 2007 and May 29, 2007.

The trends we have observed suggest that resprouts of burned pineland croton become suitable host plants within 6 months post fire. During the interim, the Florida leafwing will continue to lay eggs on nearby unburned pineland croton. Burning areas with large populations of pineland croton during wet summer conditions can leave a portion of the host plants unburned. Further research is needed to determine the appropriate size of and distance between unburned refuges.

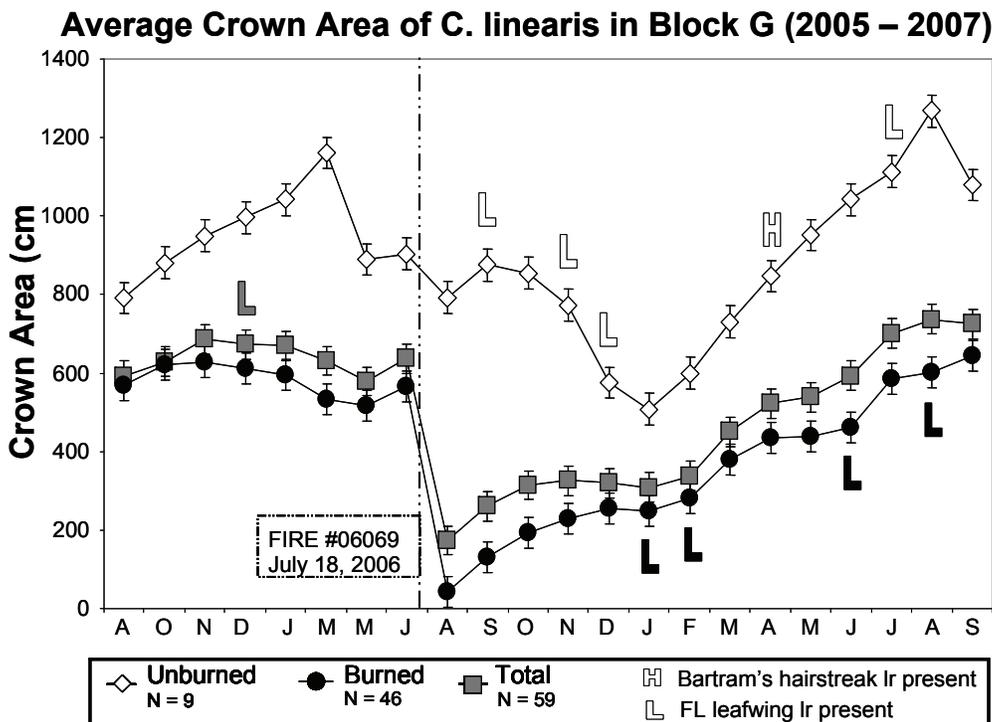


Figure 2. Average crown area of pineland croton within block G. The letters indicate the dates on which Florida leafwing (L) or Bartram's hairstreak (H) larvae were observed. White letters indicate larvae were found on unburned *C. linearis* and black letters indicate that larvae were found on resprouts of burned *C. linearis*.

## FFI and You: The Lowdown on Our New Data Management Friend

**Data Conversion:** Data conversion from FEAT is complete, and the latest versions of databases should be considered final. Now's the time for editing and cleaning up the data. Conversion for NPS non-FEAT data will begin this summer.

**Classroom FFI Training:** The last two trainings for the 2008 fiscal year were in Missoula, (May 20-23) and Asheville (June 3-6). Work with your regional fire ecologist if you are still in need of training. FFI online training has been available, and though the most recent trainings ended in April, 2008, future sessions will begin in the fall.

**Online FFI Training:** A FRAMES (Fire Research and Management Exchange System) website dedicated to FFI is available at <http://frames.nbii.gov/ffi>. A FFI Google discussion forum has been set up for technical support. The FFI website has instructions on how to be invited to join the Google discussion forum. The Google forum includes discussion forums and threads as well as static page dedicated to critical issues and known bugs. It also has a place to post documents so reference material will be posted there. Say goodbye to the FEAT forum- it will be retired soon. Farewell, old friend.

**New FFI Versions?** Another release of FFI is not planned until the fall, unless we have a major bug or an accumulation of minor bugs. If you are having problems, talk to your regional ecologist so the issues can be forwarded up the line.



Visit the FFI Website hosted on FRAMES:  
[frames.nbii.gov/ffi](http://frames.nbii.gov/ffi)

## Note From the Editor

The Association for Fire Ecology (AFE) is an organization of professionals dedicated to improving the knowledge and use of fire in land management through science and education. Like many professional organizations, it has an array of benefits, such as discounts on conferences, access to newsletters, and a network of like-minded professionals. Members include students, well known researchers, land managers, and everyone in between.



### Why Join?

In addition to the general benefits, participation in AFE gives you direct access to the latest science. The quarterly newsletter summarizes the latest fire ecology research and the online journal provides a wealth of current literature in the fire ecology field.

### In a Nutshell...

AFE helps people with an interest in fire ecology get connected, and it's relatively inexpensive (\$40/year for regular membership, \$20/year for students). Visit <http://www.fireecology.net/> to find out more.

### NGP Site Assessment Tool (Cont'd)

*(Continued from page 5)*

*Estimate of native to non-native ratio: approximately 65% native, 35 % non-native*

Common non-native species: **annual bromes (*Bromus tectorum* & *Bromus japonicus*)**

Fuel load/Fire Potential: **low to moderate**

#### Site History

Estimated historical fire regime: **frequent, high intensity fire (in the grasslands); historic fire frequency approximately 5-15 years**

Evidence of past fire: **yes, fairly high-intensity wildfire (local landowners said 1995)**

Evidence of other management actions: **grazing**

Forage Utilization: **horses on the site, but low utilization**

Photo Points Established? **YES**

Photo point IDs: **EDG 1, 2, 3**

Comments: **Condition class = 2; There has been some relatively recent fire on this site, but there is a high proportion of non-native grasses. There are nice patches of high quality, high diversity native mixed-grass prairie, but there are also patches that are completely dominated by annual brome.**

## Fire Effects Photo Contest

The NPS Fire Photo Contest has turned into quite the competition for fire management employees at the Natchez Trace Parkway. We are in a constant battle to get that winning shot. So far, no winners from here but we think the fun is in the journey.

That said, we're starting our own photo contest for fire effects. There is only one category, something having to do with fire effects.

Photos can be of cool plants, field-weary monitors, fire employee babies – the possibilities are endless.



Sherman, a stray kitty who once frequented the fire effects office at the Natchez Trace Parkway, gives tutorial on FEAT. Sherman has since gone the way of FEAT and is no longer in the office. We're sorta sad, but we'll make it. Unlike FEAT, Sherman was adopted and now lives in Louisiana.

**Submit your photo with a brief caption, date, and credit to the editor at [lisa\\_mcinnis@nps.gov](mailto:lisa_mcinnis@nps.gov). All entries are due by the last Friday in April, 2009.**

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### Historic Moments in Fire Effects Monitoring



Charred remains of missing 100 meter tape located on PIPA 9. Leave no tape behind!

# THE LIGHTER SIDE

Back By Popular Demand....

## 18 Fire Effects Monitoring Watch Outs\*

1. Maintenance log not consulted before heading off to plot.
2. You are in a park you are not familiar with and no employee of that park knows who you are, where you are, or what you are doing.
3. The parking spot was not GPS'ed and nobody knows how to get back.
4. Lightning has been observed in the sky, and you are carrying a backpack full of rebar.
5. Four people are running tapes simultaneously, and nobody knows where anybody else is heading.
6. Instructions and assignments not clear
7. You have been following the GPS for hours and are no longer in communication with supervisor/fellow crewmembers.
8. Installing plot without knowing rejection criteria.
9. Installing a plot on 60% slope.
10. Attempting plot installation amidst a field of chaparral.
11. A wall of poison oak is between you and the next rebar.
12. You cannot see plot origin, and are not in contact with anyone who can.
13. On a hillside where a bypassing car could ignite a fire below.
14. It is only 8 am, and the weather is getting hotter and drier.
15. Someone breaks wind in your vehicle.
16. Getting frequent needle-jerk in your compass.
17. Terrain and fuels make installing rebar difficult.
18. You are attempting to work a ten hour day without taking a nap.

\*Know the author(s) of these watch outs? Email the editor at [lisa\\_mcinnis@nps.gov](mailto:lisa_mcinnis@nps.gov)

### Haiku for You

FEAT to FFI  
 Quiet data migration  
 Want happy results

-Fire Ecology Steering Committee Member

Become a **BIG TIME AUTHOR!** Write for *Rx Effects*. Why? Because it's cool!  
 Everybody's doing it. Be one of the gang! See page 11 for details.

[www.nps.gov/fire/fire/fir\\_eco\\_rxeffects.cfm](http://www.nps.gov/fire/fire/fir_eco_rxeffects.cfm)

## Upcoming Conferences

See [fireecology.net/pages/1](http://fireecology.net/pages/1) for more information.

### [The '88 Fires: Yellowstone and Beyond](#)

22-27 September, 2008

Jackson Hole, Wyoming

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### [Pacific Coast Fire Conference: Changing Fire Regimes, Goals, and Ecosystems](#)

1-4 December, 2008

Holiday Inn San Diego On the Bay

San Diego, California

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### [Tall Timbers 24th Fire Ecology Conference](#)

#### [Future of Prescribed Fire: Public Awareness, Health, and Safety](#)

11-15 January, 2009

Ramada Conference Center

Tallahassee, FL

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### [4th International Fire Ecology and Management Congress: Fire as a Global Process](#)

30 November-4 December, 2009

Savannah Marriott Riverfront Hotel

Savannah, Georgia

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## RxFx Subscription and Submission Information

*Rx Effects* is the newsletter of the Fire Effects Monitoring Program in the National Park Service. It is an outlet for information on Fire Effects Monitoring, FMH, fire research and other types of

wildland fire monitoring. The newsletter is produced annually for the National Park Service but we encourage anyone with an interest in fire ecology to submit information about their program or research. Examples of submissions include: contact information for your program, summaries of your program's goals, objectives and achievements, monitoring successes and failures, modifications to plot protocols that work for your park, hints for streamlining collection of data, data entry and analysis, event schedules and abstracts of papers or posters resulting from your program. Submissions will be accepted in any format (e.g., hard copy through the mail or electronic files through e-mail). Please see our website for author instructions. The goal of the newsletter is to let the Fire Effects Monitoring community know about you and your program.

*Rx Effects* is issued each year in the summer. The **deadline for submissions** is the last Friday in April. If you would like a subscription or more information please see our website [www.nps.gov/fire/fire/fir\\_eco\\_rxeffects.cfm](http://www.nps.gov/fire/fire/fir_eco_rxeffects.cfm) or contact Lisa McInnis / 662-840-7572 / [lisa\\_mcinnis@nps.gov](mailto:lisa_mcinnis@nps.gov) / Fire Management Office, 2680 Natchez Trace Parkway, Tupelo, MS 38804

## **Rx EFFECTS**

National Park Service Fire Effects Monitoring Newsletter

FIRE MANAGEMENT OFFICE

2680 Natchez Trace Parkway

Tupelo, MS 38804



## **National Park Service Fire Effects Monitoring**

[http://www.nps.gov/fire/fire/fir\\_ecology.cfm](http://www.nps.gov/fire/fire/fir_ecology.cfm)

***Rx Effects*, The Newsletter of the NPS Fire Effects Monitoring Program**

[http://www.nps.gov/fire/fire/fir\\_eco\\_rxeffects.cfm](http://www.nps.gov/fire/fire/fir_eco_rxeffects.cfm)

